

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A cooling system for an electric motor of a vehicle, comprising:

an electric motor which drives ~~the~~ a vehicle;

a reduction gear which adjusts a driving force of an output shaft of the electric motor and transmits the driving force to a drive shaft; and

an in-shaft refrigerant passage provided in a shaft of the reduction gear and the output shaft of the electric motor;

a rotation detector chamber which houses a rotation detector for detecting rotations of the output shaft of the electric motor, the rotation detector chamber being provided on an end portion of the output shaft of the electric motor separately from a motor case; and

an outside refrigerant passage which allows an inside of the rotation detector chamber and a refrigerant feedback passage in a reduction gear case housing the reduction gear to communicate with each other outside the motor case,

wherein a refrigerant which has passed through the in-shaft refrigerant passage is collected outside a motor case housing the electric motor, and is circulated, and

the refrigerant is allowed to flow into the rotation detector chamber and is circulated to the refrigerant feedback passage through the outside refrigerant passage.

2. (Canceled)

3. (Currently Amended) A cooling system for an electric motor of a vehicle according to claim 2 1, further comprising[[[:]] a metal foreign object trap which induces a metal foreign object in the refrigerant into a pocket by a magnetic force of stator coils of the electric motor, the metal foreign object trap being provided to the outside refrigerant passage.

4. (Original) A cooling system for an electric motor of a vehicle according to claim 3, wherein an auxiliary coil is provided for the metal foreign object trap, and the magnetic force inducing the metal foreign object into the pocket is augmented by controlling a current applied to the auxiliary coil.

5. (Original) A cooling system for an electric motor of a vehicle according to claim 4, wherein a current phase of the auxiliary coil is determined based on a phase of a stator coil closest to the auxiliary coil.

6. (Original) A cooling system for an electric motor of a vehicle according to claim 4, wherein a current value of the auxiliary coil is determined in accordance with a flow amount of the refrigerant flowing through the outside refrigerant passage.

7. (Original) A cooling system for an electric motor of a vehicle according to claim 3, wherein

the refrigerant feedback passage includes a refrigerant reservoir and a pump which pumps the refrigerant in the refrigerant reservoir, and

the metal foreign object trap is provided in a vicinity of the refrigerant reservoir.

8. (Original) A cooling system for an electric motor of a vehicle according to claim 4, wherein

the refrigerant feedback passage includes a refrigerant reservoir and a pump which pumps the refrigerant in the refrigerant reservoir, and

the metal foreign object trap is provided in a vicinity of the refrigerant reservoir, and when a temperature of the refrigerant is low, only the auxiliary coil is energized in order to heat up the refrigerant by heat of the auxiliary coil.

9. (Original) A cooling system for an electric motor of a vehicle according to claim 3, wherein

valves are interposed in the outside refrigerant passage on both sides of the metal foreign object trap, and

the metal foreign object trap is made detachable from the outside refrigerant passage.

10. (Withdrawn-Currently Amended) A cooling system for an electric motor of a vehicle according to claim [[2]] 1,

wherein at least part of the outside refrigerant passage is formed of a transparent material for visually observing the refrigerant inside.

11. (Withdrawn) A cooling system for an electric motor of a vehicle according to claim 1,

wherein the in-shaft refrigerant passage has a function in which the refrigerant is pressured to be sent in an axial direction.

12. (Withdrawn) A cooling system for an electric motor of a vehicle according to claim 1,

wherein the in-shaft refrigerant passage has a shape in which heat exchange occurs between the output shaft and the refrigerant.

13. (Withdrawn) A cooling system for an electric motor of a vehicle according to claim 1,

wherein spiral grooves are formed on an inner wall of the in-shaft refrigerant passage.

14. (New) A cooling system for an electric motor of a vehicle, comprising:

an electric motor which drives the vehicle;

a motor case housing the electric motor;

a reduction gear which adjusts a driving force of an output shaft of the electric motor and transmits the driving force to a drive shaft; and

an in-shaft refrigerant passage provided in a shaft of the reduction gear and the output shaft of the electric motor,

wherein an inside of the motor case is separated from the in-shaft refrigerant passage, and a refrigerant which has passed through the in-shaft refrigerant passage does not enter the motor case.

15. (New) A cooling system for an electric motor of a vehicle according to claim 14, further comprising:

a rotation detector chamber which houses a rotation detector for detecting rotations of the output shaft of the electric motor, the rotation detector chamber being provided on an end portion of the output shaft of the electric motor separately from the motor case; and

an outside refrigerant passage which allows an inside of the rotation detector chamber and a refrigerant feedback passage in a reduction gear case housing the reduction gear to communicate with each other outside the motor case,

wherein the refrigerant is allowed to flow into the rotation detector chamber and is circulated to the refrigerant feedback passage through the outside refrigerant passage.

16. (New) A cooling system for an electric motor of a vehicle according to claim 15, further comprising a metal foreign object trap which induces a metal foreign object in the refrigerant into a pocket by a magnetic force of stator coils of the electric motor, the metal foreign object trap being provided to the outside refrigerant passage.

17. (New) A cooling system for an electric motor of a vehicle according to claim 16, wherein an auxiliary coil is provided for the metal foreign object trap, and the magnetic force inducing the metal foreign object into the pocket is augmented by controlling a current applied to the auxiliary coil.

18. (New) A cooling system for an electric motor of a vehicle according to claim 17, wherein a current phase of the auxiliary coil is determined based on a phase of a stator coil closest to the auxiliary coil.

19. (New) A cooling system for an electric motor of a vehicle according to claim 17, wherein a current value of the auxiliary coil is determined in accordance with a flow amount of the refrigerant flowing through the outside refrigerant passage.

20. (New) A cooling system for an electric motor of a vehicle according to claim 16, wherein

the refrigerant feedback passage includes a refrigerant reservoir and a pump which pumps the refrigerant in the refrigerant reservoir, and

the metal foreign object trap is provided in a vicinity of the refrigerant reservoir.

21. (New) A cooling system for an electric motor of a vehicle according to claim 17,
wherein

the refrigerant feedback passage includes a refrigerant reservoir and a pump which
pumps the refrigerant in the refrigerant reservoir, and

the metal foreign object trap is provided in a vicinity of the refrigerant reservoir, and
when a temperature of the refrigerant is low, only the auxiliary coil is energized in order to
heat up the refrigerant by heat of the auxiliary coil.

22. (New) A cooling system for an electric motor of a vehicle according to claim 16,
wherein

valves are interposed in the outside refrigerant passage on both sides of the metal
foreign object trap, and

the metal foreign object trap is made detachable from the outside refrigerant passage.